DETAILED ACTION

Examiner's Amendment

1.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

    Authorization for this examiner's amendment was given in a telephone interview

with Mr Bill Lee (Reg # 26,935) on 11/3/09.

    The application has been amended as follows:

IN THE CLAIMS:

1.   (currently amended) A method of recognizing an image, comprising the steps of
utilizing a computer or processor to:

    a. process the image to provide an image set containing a plurality of different
        processed images which are derived from the original image to be recognized;

    b. combine the processed images in the image set;

    c. transform the data space occupied by the processed images in the image set;

    d. generate, from the image-set represented in the transformed data space, an
        image key representative of the image; and

    e. compare the image key with at least one previously stored image key of a
        known image, to verify the identity of the image.

2.   (original) A method according to claim 1, wherein step a. includes extracting image
features including at least one of edges, lines, wavelets, gradient components, curvature
components and colour components.

3.   (previously presented) A method according to claim 1, wherein step b. is carried out
prior to step c.

4.   (previously presented) A method according to claim 1, wherein step c. is carried out
prior to step b.

5.   (currently amended) A method according to claim 1, wherein step e. comprises
comparing the image key with just one previously stored image key, to verify the identity of
the image.

6.   (previously presented) A method according to claim 1, wherein step e. comprises
comparing the image key with a plurality of previously stored image keys, to identify the
image.

7.   (original) A method according to claim 6, comprising the further step of sorting the
results of the comparison in step e. to produce a list of potential matches with previously
stored image keys.

8.   (previously presented) A method according to claim 6, wherein step e. is carried out
using a Euclidean distance metric (the L2 norm), mahalanobis distance metric or a cosine
distance metric.

9.   (previously presented) A method according to claim 1, including the step prior to
step a. of rotating and/or positioning the image to a predetermined orientation and/or
position and/or depth normalisation.

10.   (previously presented) A method according to claim 1, including a step prior to step
b. of normalising data prior to combination.

11.   (previously presented) A method according to claim 1, wherein said image is
obtained from a camera.

12.   (previously presented) A method according to claim 1, wherein said image
comprises 3D data.

13.   (previously presented) A method according to claim 1, wherein said image
comprises 2D data.

14.   (previously presented)) A method according to claim 12, wherein said image
comprises a registered 2D-3D image pair.

15.   (previously presented) A method according to claim 1, wherein step c. is carried out
by a Principal Component Analysis method.

16.   (previously presented) A method according to any of claims 1 to 14, wherein step c.
is carried out by Fisher's Linear Discriminant Analysis method.

17.   (previously presented) A method according to claim 1, wherein said image is an
image of a face.

18.   (previously presented) A method according to claim 1, wherein said image is an
image of a human face.

19.   (previously presented) A method according to claim 1, wherein said image is a
natural image.

20.   (previously presented) A method according to claim 1, wherein said image set
includes the original image.

21.   (cancelled)

22.   (currently amended) Apparatus for recognizing an image, the apparatus comprising:

    a. processing means arranged to process the image to provide a plurality of
        different processed images which are derived from the original image to be
        recognized;

    b. combining means arranged to combine the processed images;

      c.   reducing means arranged to reduce the data space occupied by the processed images;

      d.   generating means arranged to generate from the combined and reduced processed images an image key representative of the image; and

      e.   comparison means arranged to compare the image key with at least one previously stored image key of a known image, to verify the identity of the image.

23.   (cancelled)

24.   (cancelled)

25.   (currently amended) A method of recognizing an image, comprising the steps of utilizing a computer or processor to:

      a.   transform the data space occupied by a three dimensional image using Fisher's Linear Discriminant Analysis;

      b.   generate, from the transformed data space, an image key representative of the image; and

      c.   compare the image key with at least one previously stored image key of a known image, to verify the identity of the image.

26.   (currently amended) Apparatus for recognizing a three-dimensional image, the apparatus comprising:

      a.   means for transforming the data space occupied by a three dimensional image using Fisher's Linear Discriminant Analysis;

      b.   means for generating, from the transformed data space, an image key representative of the image; and

      c.   means for comparing the image key with at least one previously stored image

         key of a known image, to verify the identity of the image.

27.   (previously presented) Apparatus according to claim 22, wherein said processing means is arranged to extract image features including at least one of edges, lines, wavelets, gradient components, curvature components and colour components.

28.   (previously presented) Apparatus according to claim 22, wherein said reducing means is arranged to reduce said data space after said combining means combines said processed images.

29.   (previously presented) Apparatus according to claim 22, wherein said reducing means is arranged to reduce said data space before said combining means combines said processed images.

30.   (previously presented) Apparatus according to claim 22, wherein said comparison means is arranged to compare the image key with just one previously stored image key.

31.   (previously presented) Apparatus according to claim 22, wherein said comparison means is arranged to compare the image key with a plurality of previously stored image keys, to identify the image.

32.   (previously presented) Apparatus according to claim 31, further comprising sorting means arranged to sort results from said comparison means to produce a list of potential matches with previously stored image keys.

33.   (previously presented) Apparatus according to claim 31, wherein said comparison means is arranged to carry out a comparison using a Euclidean distance metric (the L2 norm), mahalanobis distance metric or a cosine distance metric.

34.   (previously presented) Apparatus according to claim 22, further comprising
normalising means arranged to normalise data prior to combination of the data by said
combination means.

35.   (previously presented) Apparatus according to claim 22, further comprising a
camera that is arranged to provide said image to be recognised.

36.   (previously presented) Apparatus according to claim 22, arranged to process 3D
image data.

37.   (previously presented) Apparatus according to claim 22, arranged to process 2D
image data.

38.   (previously presented) Apparatus according to claim 22, arranged to process an
image that comprises a registered 2D-3D image pair.

39.   (previously presented) Apparatus according to claim 22, wherein said reducing
means is arrange to carry out a Principal Component Analysis method.

40.   (previously presented) Apparatus according to claim 22, wherein said reducing
means is arrange to carry out a Fisher's Linear Discriminant Analysis method.

41.   (previously presented) Apparatus according to claim 22, arranged to process an
image of a face.

42.   (previously presented) Apparatus according to claim 22, arranged to process an
image of a human face.

43.   (previously presented) Apparatus according to claim 22, arranged to process a
natural image.

44.   (previously presented) Apparatus according to claim 22, wherein one of said

processed images includes the original image.

DETAILED ACTION

Response to Amendment

1.   Applicant's amendment filed on 7/21/09 has been entered.

In response to applicant's amendment all the prior art rejection has been withdrawn.

Claims 21, 23 and 24 are canceled claims.

Claims 27- 44 are new claims.

Claims 1- 20, 22, 25 - 44 are pending in the application.

In response to applicant's submission of Replacement Drawings and a copy of

substitute specification, filed on 7/21/09 the objections are withdrawn.

Response to Arguments

2.   Applicant's arguments filed on 7/21/09 have been fully considered and are

persuasive.

Reasons For Allowance

3.   The following is an examiner's statement of reasons for allowance:

Claims 1- 20, 22, 25 - 44, are allowed. Renumbered as 1- 41.

In response to applicant's amendment persuasive arguments (see page 12-13, of

the remarks filed on 7/21/09). The prior art of record Eraslan (US. 6,801,641 B2)

uses many different images, where all of the images are original images that are

different from one another. The example given on col 11, lines 34 to 61 is a

database of "mug shot" photos as used by a justice department. Indeed, Eraslan

provides no automated recognition step, but is concerned with generating an image

of a suspect's head from pre-stored images. For example, on col 12, lines 54-64, it is

made clear that is a law enforcement technician who forms a human face by

selecting and assembling facial feature parts and shapes from an inventory. It is the

technician who selects the nose shape etc (line 60) and the technician who selects

other facial feature shapes (lines 62-63). All of the Eraslan claims are directed to an

"image generation system". In the context of Eraslan, it is a human witness who

ultimately does the recognizing, from images generated by the Eraslan image

generation system. Thus, there is no concept in Eraslan of subjecting an original

image to a plurality of different processes, combining those different processed

images, and ultimately performing a recognition step against a stored image key

derived from the combined, different processed images (as recited in claims 1 and

22), Eraslan discloses (FLD or Fisher's Linear Discriminant) analysis was applied to

3D images rather than 2D images. Eraslan a. transform the data space occupied by

a three dimensional image using Fisher's Linear Discriminant Analysis; b. generate,

from the transformed data space, an image key representative of the image; and c.

compare the image key with at least one previously stored image key of a known

image, to verify the identity of the image (as recited in claims 25 and 26) as

commonly included in the independent claims 1, 22 25 and 26,the prior art of record

fails to teach either singularly or in combination, fails to anticipate or render the

above limitations obvious. Claims 1- 20, 22, 25 - 44, have been withdrawn from the

rejection and are allowed.

4.   Any comments considered necessary by applicant **must** be submitted on later

than the payment of the issue fee and to avoid processing delays should preferably

accompany the issue fee. Such submissions should be clearly labeled, comments on

statement of reasons for allowance.

Contact Information

5.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Sheela C Chawan whose telephone number is. 571-

272-7446. The examiner can normally be reached on Monday - Friday 8.30 am - 5.00

pm and every Wednesday work from home. If attempts to reach the examiner by

telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on

571-272-7415. The fax phone number for the organization where this application or

proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

/Sheela C Chawan/

11/1/09

Primary Examiner, Art Unit 2624.